The Importance of Nuclear Data to Modern Technology

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Knowledge of accurate nuclear data is essential in solving many of the problems of modern technology. As examples, a discussion is made of the limits of current Electronic Reliability and the "Ship Effect".

The problem of Electronic Reliability has been addressed by R. Baumann, Mgr. of Electronic Reliability for Texas Instruments. He notes that the effects of radiation, especially sea level cosmic rays, is the most important component of digital electronic failure, and its effects surpass all other modes of integrated circuit failure put together. A. Chatila, vice president of Cypress Semiconductor, has said, "Soft errors from ambient radiation are the primary limit on digital electronic reliability. In the era of ubiquitous computing, with interlaced intelligence, constant system crashes from soft fails are black clouds threatening future complexity." The study of the devastating effect of a single neutron on computer systems networks will be reviewed.

The Ship Effect concerns the interdiction of ships to detect nuclear WMD while the ships are still at sea. Swift small boats make radiation sweeps to detect the possible nuclear signature of concealed nuclear devices. The term "Ship Effect" refers to the unexpected phenomenon that very large vessels, especially laden with cargo containers, are natural sources of anomalously high neutron emission. This surprising result is reviewed.

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